April 15, 2002

MEMORANDUM TO: L. Raghavan, Chief, Section 1
Project Directorate III
Division of Licensing Project Manager
Office of Nuclear Reactor Regulation

FROM: Mohammed Shuaibi, Project Manager, Section 1 ***/RA/***
Project Directorate III
Division of Licensing Project Manager
Office of Nuclear Reactor Regulation

SUBJECT: MEETING SUMMARY FOR MARCH 19, 2002, PUBLIC WORKSHOP RELATED TO LESSONS LEARNED FROM RECENT EXTENDED POWER UPRATES

By Staff Requirements Memorandum COMNJD-01-0001, "Power Uprate Applications," dated May 24, 2001, the Commission directed the staff to, in consultation with stakeholders, identify potential areas for improvement in current power uprate processes so as to assure that the current processes do not impose needless impediments. In SECY 01-0124, the staff indicated its intent to hold a public workshop on extended power uprate (EPU) lessons learned following completion of the first few EPU reviews. The staff held this public workshop on March 19, 2002, from 8:30 a.m. to 5:30 p.m., at the U.S. Nuclear Regulatory Commission's (NRC's) Headquarters in the Two White Flint North Auditorium. The purpose of the workshop was to share and discuss lessons learned from recent EPU applications and obtain feedback on issues that should be pursued by the staff in process improvement efforts related to EPUs. The meeting notice for the workshop was issued on February 15, 2002, (ADAMS Accession Number ML020430513) and included an agenda for the workshop.

A total of 91 people attended the workshop, about half of which were external stakeholders. Attendees included representatives from the NRC staff, licensees, nuclear steam supply system vendors, architectural engineering firms, the press, other engineering firms involved in power uprate work, Institute of Nuclear Power Operations, and the Nuclear Energy Institute. A list of attendees is provided in Attachment 1.

The workshop started with introductions and opening remarks by Mr. John Zwolinski, Director, Division of Licensing Project Management (DLPM), Office of Nuclear Reactor Regulation (NRR). Opening remarks were followed by a presentation on the NRC's power uprate program by Mr. S. Singh Bajwa, Director, Project Directorate III, DLPM, NRR. I then provided a presentation of NRC lessons learned from reviews of recent EPU applications. Mr. Hoa Hoang, Power Uprate Program Manager, General Electric Nuclear Energy (GENE) provided an overview of the GENE power uprate program and was followed by presentations of lessons learned by Mr. Allan R. Haeger, Nuclear Licensing Administrator, Exelon General Company and Mr. Tony Browning, Principal Licensing Engineer, Nuclear Management Company (NMC). Mr. Haeger covered Exelon lessons learned from the recent Dresden and Quad Cities EPUs while Mr. Browning covered the NMC lessons learned from the recent Duane Arnold Energy Center EPU. Mr. John Fasnacht, Manager, Integrated Plant Engineering Services,

Westinghouse Electric Corporation, provided an overview of the Westinghouse power uprate program. Mr. Mehran Golbabai, Power Uprate Program Manager, Westinghouse Electric Corporation, provided a vendor's perspective on the recent Arkansas Nuclear One Unit 2 (ANO-2) EPU experience. Messers Bryan Daiber and Roger Wilson of Entergy Operation then covered Entergy lessons learned from the ANO-2 EPU. The last presentation was made by Mr. Martin Parece, Manager, Project Development, Engineering and Licensing, Framatome and covered the Framatome power uprate program. The slides used for these presentations are provided in Attachment 2.

In addition to presentations, the workshop included breakout sessions during which the attendees were divided into groups and tasked with identifying areas in EPU processes that could be improved and provide ideas on how to improve them. The groups presented their feedback to the other participants at the workshop. Detailed feedback is included in Attachment 3.

Following the presentations, Mr. Bajwa provided the following key highlights of the workshop and the feedback received:

Requests for Additional Information

Participants indicated that improvements should be made to reduce the volume of requests for additional information (RAIs) generated by the staff during its review of power uprate applications. Participants recommended that one way to reduce the volume of RAIs is for the staff to conduct more onsite audits in the areas of mechanical engineering and probabilistic safety assessment reviews.

Guidance

Participants indicated that more guidance is needed on the scope and level of detail to be included in licensee submittals. However, participants recommended against development of a standard review plan (SRP) because (1) development of an SRP would not be completed in time to benefit EPUs expected in the near term, and (2) the plant-specific nature of licensing bases and modifications needed to achieve a power uprate would make it hard to develop generically applicable guidance. One group recommended that vendors develop a writer's guide for their plant designs that licensees and the NRC staff can review and endorse.

Advisory Committee on Reactor Safeguards (ACRS)

Participants recommended that the ACRS should establish a scope for their review and develop a plan by which ACRS can gain sufficient confidence in certain types of power uprates without having to review all future applications.

Schedule

Participants recommended stronger schedule management by NRC and licensees including identification and enforcement of milestone due dates.

Consistency of Staff Review

Participants recommended making staff reviews more consistent by establishing a power uprate review team that would operate in a matrix organization structure.

Requests for Withholding of Proprietary Information

Participants recommended the development of more guidance related to the type of information that can be declared proprietary.

Mr. Tad Mash, Deputy Director, DLPM, NRR provided closing remarks. Mr. Marsh expressed his satisfaction with the active participation of attendees and stated that the staff will consider the feedback received in its efforts related EPUs.

The staff believes the workshop was very beneficial for focusing its next steps in the area of power uprate process improvements. Participants provided good and candid feedback that the staff will consider in its evaluation of the benefits of developing an SRP and in the development of an effectiveness and efficiency plan for power uprates. The workshop met the staff's expectations and, therefore, we consider it a success.

Attachments: 1. List of Attendees
2. NRC Slides for March 19, 2002, Public Workshop
3. Stakeholder Feedback

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| DATE | 04/12/02 | 04/12/02 | 04/12/02 | 04/15/02 |

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LIST OF ATTENDEES

| NAME | ORGANIZATION |
|---|---|
| Ira Owens | Sargent & Lundy |
| Frank Akstulewicz | NRC/NRR |
| Tim Abney | Tennessee Valley Authority |
| Charles Brinkman | Westinghouse |
| Ed Hartwig | Tennessee Valley Authority |
| Dale Thatcher | NRC/NRR |
| S. Singh Bajwa | NRC/NRR |
| David Shum | NRC/NRR |
| Raj Goel | NRC/NRR |
| Ralph Caruso | NRC/NRR |
| Brenda Mozafari | NRC/NRR |
| Mohammed Shuaibi | NRC/NRR |
| John Zwolinski | NRC/NRR |
| Al Haeger | Exelon |
| J. W. Blattner | Sargent & Lundy |
| M. A. Turkal | CP&L |
| W.S. Gibson | INPO |
| John Durhan | NISYS |
| Brian Hobbs | Vermont Yankee |
| Nancy Chapman | Serch/Bechtel |
| D. Scott | Framatome ANP |
| Mike Schoppman | NEI |
| Jerry Jackson | NRC/RES |
| Raymond H. Wright | Tennessee Valley Authority - BFN |
| Dan Collins | NRC/NRR |
| Martin Parece | Framatome |

ATTACHMENT 1

| NAME | ORGANIZATION |
|---|---|
| Tony Attard | NRC/NRR |
| Carl Meyer | NRC/RES |
| Emin Ortalan | PSEG |
| Deann Raleigh | Scientech |
| James Nicholson | Stone & Webster |
| Rick Scofield | Omaha PPD |
| Ken Boone | CEG/CNS |
| Craig Nichols | Vermont Yankee |
| Ron McGee | R&R McGee, Inc. |
| Bryan Daiber | Entergy-ANO-2 |
| Roger Wilson | Entergy-ANO-2 |
| Greg Ashley | ITSC |
| Fred Maass | Framatome-ANP |
| John Tsao | NRC/NRR |
| Mike O'Keefe | NAESCO |
| Roy Mathew | NRC/NRR |
| Hukam Garg | NRC/NRR |
| Puneet Bahl | SUPC |
| Mike Knapik | Platts |
| L.B. Marsh | NRC/NRR |
| J.F. Mallay | Framatome ANP |
| Ralph Architzel | NRC/NRR |
| R. Pettis | NRC/NRR |
| Tom Behringer | Sargent & Lundy |
| Mehran Golbabai | Westinghouse |
| Hary Hanneman | NMC |

| NAME | ORGANIZATION |
|---|---|
| Dave Dominicis | Westinghouse |
| Sue Jaquith | Westinghouse |
| C. Holden | NRC/NRR |
| R. Pulsifer | NRC/NRR |
| G. Thomas | NRC/NRR |
| Y. Hsii | NRC/NRR |
| J. Mezaranps | Siemens |
| K. Parczewski | NRC/NRR |
| N. K. Trehan | NRC/NRR |
| D. G. Harrison | NRC/NRR |
| E. Thomas | NRC/NRR |
| George Georgiev | NRC/NRR |
| Steve Lavie | NRC/NRR |
| Hoa Hoang | General Electric |
| Joe Donoghue | NRC/NRR |
| George Thomas | Entergy |
| Tony Browning | NMC/DAEC |
| Michael Garrett | Framatome |
| C. Jeff Richardson | Entergy |
| George Stramback | General Electric Nuclear Energy |
| Ed Kleeh | NRC/NRR |
| John Fasnacht | Westinghouse |
| Peter Breglio | Proto Power |
| Gregory Hill | AEP |
| Don Boulton | Duke Engineering |
| Larry Rossbach | NRC/NRR |

| NAME | ORGANIZATION |
|---|---|
| Kulin Desai | NRC/NRR |
| Jared Wermiel | NRC/NRR |
| Charles Hinson | NRC/NRR |
| John Boska | NRC/NRR |
| Chris Grimes | NRC/NRR |
| Lambros Lois | NRC/NRR |
| Ralph Schwartzbeck | Enercon |
| Sarah Colpo | NRC/NRR |
| Sean Peters | NRC/NRR |
| Balwant K. Singal | Bechtel |
| Samuel Miranda | NRC/NRR |
| Drew Holland | NRC/NRR |
| Zena Abdullahi | NRC/NRR |

NRC/NRR = Nuclear Regulatory Commission/Office of Nuclear Reactor Regulation
NRC/RES = Nuclear Regulatory Commission/Office of Nuclear Regulatory Research

ATTACHMENT 2

SLIDES FROM MARCH 19, 2002, WORKSHOP

# FEEDBACK FROM BREAKOUT SESSIONS

## Group I:

I.1. Guidance is needed for the scope and level of detail to be included in extended power uprate (EPU) submittals

I.2. Nuclear Steam Supply System Vendors could develop writers' guides and send them to licensees and Nuclear Regulatory Commission (NRC) for review to ensure that the writers' guides include appropriate guidance.

I.3. The writers' guides could be kept up to date by reviewing recent EPU submittals and associated requests for additional information (RAIs) and incorporating guidance to address the RAIs generated by the staff during EPU reviews.

I.4. A pre-application meeting should be held between a licensee submitting an EPU application and the NRC staff. The meeting should cover plant-specific aspects of the EPU, common aspects of the EPU, differences between this and other EPUs, and the level of detail to be provided about each of these categories.

I.5. During the review, the licensee and the staff should maximize communication via conference calls to ensure that a common understanding of any RAIs and/or concerns exists.

I.6. The staff and the licensee should discuss draft RAIs before formally issuing them to ensure that a common understanding exists regarding the information being requested and the need for the information.

I.7. Licensees should provide more detail on plant specific issues in their EPU submittals.

I.8. To the extent possible, the licensee and staff should decouple issues that are not EPU related from the EPU review.

## Group II:

II.1. Guidance is needed on the format of submittals. However, development of a standard review plan (SRP) is not recommended because it would not be ready in time to benefit many of the expected future EPUs.

II.2. A mechanism is needed to allow sharing of RAIs between vendors and licensees.

II.3. Pre-application meetings should be held between the licensee submitting an EPU application and the NRC staff.

II.4. The threshold for review by the Advisory Committee on Reactor Safeguards (ACRS) should be re-evaluated to account for experience.

II.5. The review scope and review criteria for balance of plant systems should be better defined.

II.6. The staff and the licensee should discuss draft RAIs before formally issuing them to ensure that a common understanding exists regarding the information being requested and the need for the information. Such discussion can reduce unnecessary RAIs.

II.7. The NRC should promptly assign a review team to EPU applications when submitted.

II.8. The NRC should focus efforts on (1) review scope control, and (2) strong schedule/project management (i.e., man-hour burn rate, etc.)

II.9. Because EPUs will vary from site to site, guidance and requirements must be carefully balanced to avoid burdening all licensees for the need for a few.

**Group III:**

III.1. Guidance is needed and development of an SRP would be useful. However, development of an SRP would be impractical due to the long time needed for developing such an SRP and the near term need for guidance.

III.2. A guidance document should be developed that:
a. Provides guidance on the level of detail expected in a submittal.
b. Identifies accepted processes and methods (e.g., ELTR1 and ELTR2 ).
c. Provides guidance on the type of information needed so show compliance with accepted methods.
d. Provides guidance on the type of information needed for balance of plant systems.

III.3. An electronic searchable database of RAIs is needed to allow licensees to identify areas of past concern that should be addressed in future submittals.

III.4. The NRC should perform a self-assessment related to RAIs.

III.5. The staff should augment its review with on-site audits, as necessary. Areas where such audits can reduce RAIs include mechanical engineering, probabilistic safety assessment, and containment.

III.6. The NRC and licensees should maintain a detailed milestone schedule and should review the schedule weekly.

III.7. The NRC should limit EPU reviews to current plant-specific licensing bases.

III.8. The NRC should provide RAIs early in the review process.

III.9. The ACRS and the NRC staff should develop a review plan that identifies critical areas of EPU for ACRS review.

III.10. Due to the large number of power uprates expected, the NRC should establish an submittal schedule "queue."

III.11. The NRC should provide guidance on the type of information that can be declared proprietary.

**Group IV:**

IV.1. Guidance on content, organization, and level of detail to be included in licensee submittals is needed.

IV.2. Guidance can standardize format of submittals.

IV.3. Information and format should be consist with plant-specific updated final safety analysis reports, design bases, and licensing bases.

IV.4. The staff should use regulatory issue summary (RIS) 2002-03 as a base for developing guidance for EPUs and add additional guidance or expand the existing guidance where necessary.

IV.5. Developing an SRP is not the preferred choice. RIS 2002-03 provided good guidance for measurement uncertainty recapture power uprates. The staff should issue similar guidance for EPUs.

IV.6. The NRC should provide the criteria used in overall determination of the threshold for ACRS review (I.e., what is the driver for ACRS review, especially for BWRs where sufficient experience has been gained).

IV.7. Licensees should address the limitations on methods referenced in EPU submittals and describe the process used to show that the methods continue to apply at the EPU conditions.

IV.8. Licensees and the staff should hold technical meetings following sumbittal of EPU applications and prior to conducting the detailed review so that the licensee can "walk" the reviewers through the application and discuss the different areas in it.

IV.9. The staff and licensees should discuss draft RAIs before formally issuing them to ensure that a common understanding exists regarding the information being requested and the need for the information. Such discussion can reduce unnecessary RAIs.

IV.10. The staff can achieve more consistency in its reviews if the same team of reviewers is assigned to EPU reviews.

**Group V:**

V.1. Guidance on level of detail to be included in EPU applications is needed.

V.2. RIS 2002-03 includes a good format and framework and is a good starting point for the guidance for EPUs. A graded approach, based on magnitude of the requested EPU, should be used for level of detail needed by the staff.

V.3. On-site audits are a good tool for staff reviews but should not be repetitive.

V.4. On-site audits should be used in more areas (e.g., mechanical engineering and probabilistic safety assessment) to resolve issues and reduce the number of RAIs.

V.5. The review scope for balance of plant system reviews should be limited to safety considerations.

V.6. Concurrent modifications (e.g., maximum extended load line limit analysis, introduction of new fuel, balance of plant modifications, and implementation of alternate source term) have a major impact on staff resources when submitted with the EPU. Such changes should be pursued separately and prior to EPU when possible.

V.7. Licensees should provide a discussion that shows that methods used for the EPU remain within their limits of applicability at the EPU conditions.